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Glassware Maintenance

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1 Scope and Application

1.1 This is a procedure used to clean laboratory glassware. While this procedure describes a general cleanup technique, unique samples may require additional cleanup approaches to achieve interference-free glassware. *Note: Acetone should never be used in cleaning glassware to be used for TO-11A analysis. Also, TO-11A glassware should never be baked higher than 80°C. See Section 10.3 for manual cleaning of TO-11A glassware.*

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2 Definitions

2.1 Refer to Section 3 and Section 4 of the Georgia EPD Laboratory Quality Assurance Manual for quality control definitions.

3 Interferences

3.1 Glassware must be scrupulously cleaned with hot water and detergent followed by de-ionized water then rinsed with methanol followed by acetone. The use of high purity reagents and solvents helps to minimize interference problems.

4 Safety

4.1 Refer to the Laboratory Chemical Hygiene Plan, online revision.

5 Apparatus and Equipment

5.1 Industrial Automatic Washer: Steris Reliance 400XLS or equivalent
5.2 Oven: Fisher Isotemp or equivalent, 105°C
5.3 Cleaning brushes: various sizes
5.4 Gloves: latex, elbow length

6 Reagents and Standards

6.1 Liquid Detergent
6.1.1 For manual cleaning with neutral pH: Contrad, Steris Liqui-Jet 2 or equivalent
6.1.2 For automated cleaning with neutral pH: Steris Glass Klenz or equivalent
6.2 Methanol: organic residue analysis grade
6.3 Acetone: organic residue analysis grade
6.4 De-Ionized Water or equivalent

7 Sample Collection
7.1 Not Applicable

8 Calibration
8.1 Not Applicable

9 Quality Control
9.1 Not Applicable

10 Procedure
10.1 Manual Washing (excluding TO-11A Glassware, see Sec. 10.3)
10.1.1 Place small and delicate items in the sink, add a small amount of detergent (no more than 1mL) then fill with warm water and soak for 1 hour.
10.1.2 Wash with a brush then rinse thoroughly with de-ionized water.
10.1.3 Allow to air dry.
10.1.3.1 Optional: Glassware may be placed in the glassware drying oven at 105ºC and allowed to dry.
10.1.3.2 Once glassware has dried in the oven, remove glassware with provided oven mitts and allow the glassware to cool to room temperature.
10.1.4 Go to step 10.2.13.
10.2 Automatic Washing (excluding TO-11A Glassware, see Sec. 10.3)
10.2.1 Using the touchscreen on the right panel of the washer, press the "Wake"icon.
10.2.2 Then press the "open door" icon to the lower left of the touchscreen to open the door. The "open door" icon looks like an "up" arrow.
10.2.3 Place the glassware washing accessories to be used onto the washer manifold ensuring that washing accessory's lower aperture aligns with the manifold port to facilitate water flow through the aperture.
10.2.4 Place the appropriate racks or general purpose baskets into the washer and load the dirty glassware securely.
10.2.5 Use baskets or racks if needed to cover and secure glassware and other small glassware accessories to prevent loss and breakage.
10.2.6 Before starting the wash cycle, check to ensure there is adequate liquid detergent in the container beside the washer to be used in the wash cycle.
10.2.6.1 If there isn't enough liquid detergent, remove the detergent probe from the detergent container and open a new detergent container and place the detergent probe into the new detergent container.

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10.2.7 Check to make sure that no glassware is blocking the washer door.
10.2.8 Press the "close door" icon at the lower left of the touchscreen to close the washer door. The "close door" icon looks like a "down" arrow.
10.2.9 Press the "Start Cycle" icon on the touchscreen.
10.2.10 Allow the washer to complete its wash cycle which includes a pre-wash, rinse, wash, rinse and drying cycles. The total wash cycle lasts approximately one hour.
10.2.11 After the wash cycle has completed, the touchscreen will display a "Cycle Completed" message. Press the "open door" icon and remove the cleaned glassware then press the "close door" icon.
10.2.12 Place the cleaned glassware onto the drying racks on the center counter top in the washroom to further air dry.
10.2.12.1 Optional: Glassware may be placed in the glassware drying oven at 105ºC and allowed to dry.
10.2.12.2 Once glassware has dried in the oven, remove glassware with provided oven mitts and allow the glassware to cool to room temperature.
10.2.13 Once the glassware is dry and at room temperature, it is rinsed thoroughly with methanol and then rinsed again with acetone.
10.2.14 Allow the rinsing solvents to evaporate thoroughly in the washroom fume hood and then return the glassware to their proper storage locations.

10.3 Manual Washing of TO-11A Glassware
10.3.1 TO-11A glassware must not be rinsed with acetone and may not be baked at 105°C.
10.3.2 TO-11A glassware is manually washed in the same room as the TO-11A extraction fume hood.
10.3.3 Place the TO-11A glassware in the sink, add a small amount of detergent (no more than 1mL) then fill with warm water and soak for 1 hour.
10.3.4 Wash with a brush then rinse thoroughly with de-ionized water.
10.3.5 Allow to air dry.
10.3.6 Rinse glassware thoroughly with acetonitrile and allow the acetonitrile to evaporate completely in the TO-11A extraction fume hood.
10.3.7 Once the acetonitrile has evaporated, the TO-11A glassware may be stored in an appropriate location.

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11 Calculations

11.1 Not Applicable

12 Waste Management

12.1 See GA EPD Laboratory SOP – EPD Laboratory Waste Management Standard Operating Procedures, online revision.

13 References

13.1 Manual for the Certification of Laboratories Analyzing Drinking Water, Criteria and Procedures Quality Assurance, Fifth Edition, Table IV-1

13.2 Technical Assistance Document for the National Air Toxics Trends Stations Program, Rev. 3, October 2016, Section 4.3.9.1.2

14 Reporting Limits (RLs), Precision and Accuracy Criteria and Quality Control Approach

14.1 Not Applicable

15 Associated LabWorks Test Codes

15.1 Not Applicable

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